

view that the university should be to enable the youth of the country to develop their faculties to their full capacity, and to permit them to compete on even terms in the practical business of life with those outside as well as inside Australia. Dr. Hill, in a valuable contribution to the discussion, advocated the utilisation of existing institutions, the training college for teachers, the magnificent observatory, the museum, zoological gardens, law courts, and hospital, for the teaching purposes of the university, and suggested that many of the gentlemen holding Government appointments, the geologist, electrician, bacteriologist, &c., were eminently fitted to occupy university chairs in addition to their official duties. They did not require a palace for a start, but the men. In these days of change a great stone building was a disadvantage. His idea was to forget finance, and to coordinate the existing material. Ultimately a resolution in favour of the establishment of a university was carried with practical unanimity.

At present the higher education of Western Australia is in the hands of the University of Adelaide, which conducts the examinations and gives courses of extension lectures, and this system has worked well in the past, but naturally is only provisional. In addition, the Gilchrist trustees, through Dr. R. D. Roberts, of the London University Extension Board, have for the past three years contributed to the expense of sending an annual lecturer from this country to give a course of lectures in some branch of science. These lectures are eagerly attended, and now form quite a feature in the intellectual life of the State, periodically stimulating the movement in favour of an independent university. Audiences of from 1000 to 1500 are sometimes drawn. It is difficult to say whether the lecturer or his audience derive the greater benefit. Certainly a trip round the world with a course of lectures, taking one over a large part of a new continent, among the goldfields of Kalgurli, the jarrah and karri forests of the south-west, the orchards and vineyards of Armadale, is an experience fitted to make a lecturer return to his homely desk with "renewed vinegar."

The present writer recalls many a strange impression from his lecturing experience in Western Australia; a wine neither a hock, a claret, nor a madeira, something of each, but better than all; a third-class sleeping carriage on a narrow-gauge, single-line railway, not yet to be found on our boasted Scotch expresses; gold in sight in the wall-face of one working not yet worked, estimated of the value of half a million sterling; a water scheme for supplying the mines, pumping a million and a half gallons daily over a watershed of 1500 feet a distance of 300 miles, in which the water spends six weeks in the pipes before reaching its destination; a camel, the only need of which in the desert is a weekly drink of water costing, maybe, 30s.; a criticism of the last night's lecture scribbled in pencil at the bottom of one mine, and delivered to the lecturer in the next without coming nearer the surface than 1200 feet; a rabbit which survived two summers of drought without water; and a clergyman who took for his text "Radium."

In wishing the university movement well in Western Australia, one may express the hope that it will still continue its policy of inviting outside lecturers to come and learn as well as to teach, and that many professors without portfolios may be induced to visit its shores in the future, to carry back with them an idea of a developing outside world which in the cloistered seclusion of a university is in danger of slipping from the memory.

F. S.

NOTES.

THE following is a list of fellows who have been recommended by the president and council of the Royal Society for election into the council for the ensuing year:—*president*, Lord Rayleigh; *treasurer*, Mr. A. B. Kempe; *secretaries*, Prof. J. Larmor, Sir Archibald Geikie; *foreign secretary*, Mr. Francis Darwin; *other members of the council* (the fellows whose names are printed in italics are not members of the existing council), *Lord Avebury*, *Sir Benjamin Baker*, K.C.B., *Dr. H. F. Baker*, Prof. J. Norman Collie, Prof. Wyndham R. Dunstan, *Prof. David Ferrier*, *Prof. Sydney J. Hickson*, *Sir William Huggins*, K.C.B., Prof. E. Ray Lankester, Mr. H. F. Newall, *Dr. Alexander Scott*, *Prof. A. C. Seward*, *Prof. W. J. Sollas*, Prof. E. H. Starling, *Prof. Silvanus P. Thompson*, and *Dr. A. D. Waller*.

THE Royal Society's medals have this year been adjudicated by the president and council as follows:—the Copley medal to Prof. Elias Metchnikoff, for the importance of his work in zoology and in pathology; the Rumford medal to Prof. Hugh Longbourne Callendar, for his experimental work on heat; a Royal medal to Prof. Alfred George Greenhill, for his contributions to mathematics, especially the elliptic functions and their applications; a Royal medal to Dr. Dukinfield Henry Scott, for his investigations and discoveries in connection with the structure and relationships of fossil plants; the Davy medal to Prof. Rudolf Fittig, for his investigations in chemistry, and especially for his work in lactones and acids; the Darwin medal to Prof. Hugh de Vries, on the ground of the significance and extent of his experimental investigations in heredity and variation; the Hughes medal to Mrs. W. E. Ayrton, for her experimental investigations on the electric arc, and also upon sand ripples. The King has approved of the award of the Royal medals. The medals will, as usual, be presented at the anniversary meeting on St. Andrew's Day (November 30). The society will dine together at the Whitehall Rooms on the evening of the same day.

Two events during the past few days have shown that men of science recognise the ability of women to originate and carry out scientific research and inspire others with their spirit. One is that on Thursday last the Royal Society awarded the Hughes medal to Mrs. W. E. Ayrton, for her experimental investigations on the electric arc and also upon sand ripples; and the other event is the first lecture delivered at the Sorbonne on Monday by Mme. Curie, who has succeeded the late Prof. Curie in the chair of general physics of the University of Paris. Both Mrs. Ayrton and Mme. Curie originated and carried out their scientific investigations unaided, and the tacit acknowledgment just made of their creative capacity—essential to work of this kind—is interesting and significant. Though some of Mrs. Ayrton's experiments on the electric arc were made in the laboratories under Prof. Ayrton's charge at the Central Technical College, it was to her alone that the conception and carrying out of the experiments were due, as well as the original speculations deduced from the results. The Royal Society, by placing Mrs. Ayrton's name alone, and not bracketed with that of a man, in the list of medallists for this year has manifested its recognition of individual work by a woman. The Davy medal was awarded by the society in 1903 to Prof. Curie and Mme. Curie jointly, for their researches on radium, though the published work on the subject shows that the discovery of radium was due to Mme.

Curie alone. But however this may be, it should be gratifying to those who have worked for the extension of opportunities for intellectual work by women to find that the scientific world is prepared to acknowledge merit without distinction of sex. The logical result of the action of the Royal Society and the University of Paris is that women should be eligible for election into any society or academy that exists for the purpose of extending the boundaries of natural knowledge.

A MEETING of the executive committee of the British Science Guild was held at the rooms of the Royal Society on November 2, Mr. Haldane, M.P., president of the Guild, in the chair. In addition to the ordinary business, the following matters were under consideration:—a memorandum on the application of improved methods in agriculture; an interim report of a subcommittee of the Guild on the amendment of the British patent laws; the appointment of local committees of the Guild in industrial centres; and the proposed anthropometrical survey.

DR. J. GUNNAR ANDERSON has been appointed director-general of the Geological Survey of Sweden in succession to Dr. A. E. Törnebohm, who retires.

THE Swiney lectures on geology, in connection with the British Museum (Natural History), are being delivered this year by Dr. R. F. Scharff, who commenced on Monday a course of twelve lectures on the "Geological History of the European Fauna" in the lecture theatre of the Victoria and Albert Museum, South Kensington. The lectures will be given on Mondays, Wednesdays, and Fridays, at 6 p.m. Admission to the course is free.

DR. POIRIER, professor of anatomy at the Paris Academy of Medicine, has proposed the establishment of an organisation to combine the efforts of French investigators who are studying cancer. It is hoped that France will before long have an institute similar to that in connection with our Imperial Cancer Research Fund, and to corresponding institutions in Germany and the United States. Dr. Henri de Rothschild has contributed 4000*l.* to the funds of the proposed league against cancer.

THE preliminary forecast of the indigo crop of Bengal for 1906 is given in the *Pioneer Mail*. It appears that owing to the competition of the synthetic dye, the area under indigo has contracted very rapidly. The cultivation is being gradually abandoned in Lower Bengal. The total area sown this year is 138,300 acres, against 170,700 acres of last year, and 223,100 acres of 1904. Of the important districts, Saran reports 62 per cent. of a normal outturn per acre, Darbhanga reports 57 per cent., and Muzaffarpur 33 per cent., while Champaran reports only 27 per cent. The estimated outturn per acre for Lower Bengal, including the minor Behar districts, is 67 per cent. of a normal crop, and that for North Behar, including Monghyr, only 42 per cent. The average for the province comes to 46 per cent., against 47 per cent. The director of agriculture, however, thinks the district officers' estimates are unduly pessimistic.

COMMANDER R. E. PEARY, who has been in the Arctic region since July, 1905, when he left New York on the steamer *Roosevelt* to make a further attempt to reach the North Pole, arrived in Battle Harbour, Labrador, on November 3, and dispatched a message announcing his return. From this it appears that the expedition wintered on the north coast of Grant Land, somewhat north of the *Alert's* winter quarters. In February the sledge party went north *via* Hecla and Columbia, but was delayed by

open water between 84° and 85°. Beyond 85° a six days' gale disrupted the ice, destroyed the caches, cut off communication with the supporting bodies, and drifted the party due east. Journeying over ice, farthest north was reached in lat. 87° 6', while the ice was drifting steadily eastward. The north coast of Greenland was arrived at afterwards, and by travelling along the Greenland coast the ship was regained. A sledge journey was then made to the west, and the message states that the party "completed the north coast of Grant Land, and reached other land near the hundredth meridian." Further details about the movement of the ice, and the land to the north of the hundredth meridian west of Greenwich, that is, north of the American mainland, will be awaited with interest. The most northerly point reached—lat. 87° 6'—is nearly three degrees farther north than Commander Peary attained in 1902. The Duke of the Abruzzi's expedition reached lat. 86° 33' 49", in long. 64° 30' E., in 1900.

THE promise of an interesting and useful addition to the local museums in the London district has been furnished by the spirited action of the Tottenham Local Board. In 1892 the Board purchased the fine "Queen Anne" mansion known as Bruce Castle from Mr. Joshua Pedley at the price he had given for it, 15,000*l.*, toward which sum he contributed 700*l.*, in the hope that some day the house would become the home of a museum for Tottenham. The estate included twenty acres of garden and timbered land, which was soon thrown open as a public park. The idea of a museum having been grasped, many specimens and offers of aid came in from neighbours and friends. By gift, and as a result of a public subscription, several important collections were acquired. Especially worthy of mention are the long series of birds, small mammals, and insects in cases and cabinets, made by Mr. H. W. Roberts, formerly a resident in Tottenham; a collection of minerals and fossils formed by Mr. Penstone, a friend of John Ruskin; and the collections of fossils and wax models made and lent by Mr. H. E. H. Smedley. Mr. Smedley is acting as honorary curator, and has generously devoted much time and skill to getting the collections into a fit state for public exhibition. Other important gifts have been made by Mr. C. C. Knight, the Hon. Walter Rothschild, Mr. Ruck, Mr. Currie, and others. The museum was publicly opened by Mr. W. W. Lewin, chairman of the libraries committee, and Councillor Knight on October 26. Mr. Smedley is responsible for the scheme of the museum, which will embrace a purely local collection of Middlesex natural history and illustrations of ancient Tottenham, while the educational aspect will be kept well in view, including exhibitions of living animals and plants designed to encourage observation at first-hand in the field amongst the young people and school pupils in the district.

IN commemoration of the forty years' reign of H.M. King Charles I. of Rumania, an exhibition is now being held at Bucharest, where the fifth Congress of the Rumanian Association of Science also assembled during last month, and was attended by more than four thousand members. Judging from the importance of the papers read and the discussions following, there is noticeable a decided advance in the appreciation of the value of education on the part of the Rumanians. The congress was divided into ten sections, the best attended being the one dealing with educational science, numbering more than three thousand members, including university professors and teachers of all classes. Great attention was given in this section to the question of extending the

number of hours at schools prescribed for physical training and military drill. The economic science section was also well attended, and great interest was attached to the papers read dealing with the betterment of the status of the peasantry, a subject which engages the attention of all political parties of the country. The outcome of this meeting has been the inauguration of a special society, starting with above two hundred members, and having as its object the thorough investigation and discussion of the social and economic problems of Rumania. One of the characteristic features of the congress was the fact that, for the first time, the clergy, as a body, participated by forming a separate section, and among other questions discussed the scientific aspects of religious teaching. It is believed that the industrial and commercial section will grow in importance in the near future. Among the other sections in which good work was done, mention may be made of the medical, physical, and chemical sections. On the whole, more than 160 papers were read. Much credit is due for the success of the congress to the president, secretaries, and council of the association, who, through their energy and zeal, have secured a promising future for their association, in the welfare of which the King and Queen of Rumania and the Royal Family take a great interest. The next congress will be held in September, 1907, at Focsani.

CORALLINES and burrowing-sponges, illustrated by a plate reproduced from Johnston, together with an account of the abnormally grown beak of a bird (presumably a rook, although no statement to that effect is made in the text), and sundry notes and observations on natural history, form the chief zoological contents of the *Museum Gazette* for October.

THE issues of *Naturwissenschaftliche Rundschau* (published at Brunswick) for October 11 and 18 contain articles on "embryonic transplantation" (*embryonale Transplantation*) and the present state of our knowledge of the "rarer earths." Embryonic transplantation, it will be remembered, was the name given by G. Born, of Frankfort-on-Maine, to the operation of grafting portions of one young larva of a newt or frog on the body of another, whereby two-headed or double-tailed monsters were produced. In the opinion of the author, Prof. H. Spemann, of Würzburg, the continuation of such experiments would probably shed light on certain obscure biological problems. In the course of his article on the rarer earths, Dr. R. J. Meyer, of Berlin, points out that scandium, which was found in 1879 in gadolinite and euxenite, and appears never to have been seen again in that state, is the scarcest member of the whole group, if, indeed, it be rightly included therein.

To the October issue of the *American Naturalist* Mr. J. C. Herrick communicates an illustrated account of the results of his investigations into the mechanism of the dental, or "odontophoral," apparatus of the gastropod *Fulgur*, or *Sycotypus, canaliculatus*. Especial attention was directed in this investigation to the discovery of the manner in which the gastropod perforates the shells of other molluscs. The mechanism of the "radula," or dental apparatus, corresponds, in the case of this genus at any rate, to the action of a chain-saw, with the restriction that the sawing action is accomplished only during the return stroke. The buccal cartilage forms a stiff framework and a grooved passage for the radular sac and the retractor muscle of the dental ribband. The muscles for protruding and retracting the radula are of very

different power, owing to the fact that, from the backward direction of the teeth, the rasping is accomplished during the return pull. The author might have added that the chain-saw action is continued during the process of feeding. The second article, by Mr. L. B. Walton, deals with the microscopic fresh-water annelids of the family Naididae obtained at Cedar Point, Ohio.

To the October *Zoologist* Mr. R. B. Lodge contributes an interesting article on pelicans in Eastern Europe, illustrated by the reproduction of a group of *Pelecanus crispus* on an island in an Albanian river. In the case of *P. onocrotalus*, the parents have been stated to feed their young from the pouch, but in the species observed by the author the young birds were seen to thrust their heads into the parental throat much below the opening of the pouch, thus resembling young cormorants. The nests were generally in groups of six or eight, the majority mere flat rings of sticks on the ground, but a few large structures of sticks some 2 feet in height, and very similar to cormorants' nests. In a second article Mr. Harvie-Brown discusses the best method of identifying the nests of the various species of wild ducks by means of the down with which they are lined, and shows that exact observations are necessary before our information on this subject can be regarded as anything near complete. The past history of the kite in Somerset forms the subject of a communication by Mr. F. L. Blathwayt, while Mr. B. F. Cummings discusses Goldsmith's qualifications as a naturalist. In the "Notes" column Mr. Harvie-Brown is enabled to announce, from the evidence of notes and a sketch communicated by the Duchess of Bedford, that the "sea-monster" recently seen in Loch Broom, on the Cromarty coast, was almost certainly a basking-shark.

GUMMING of sugar-cane plants forms the subject of Bulletin No. 3 issued from the pathological division at the experiment station of the Hawaiian Sugar Planters' Association. The author, Mr. N. A. Cobb, was the first to ascribe the disease to a bacterium; this opinion has been confirmed, and the organism has received the name of *Bacterium vascularum*. Diseased plants can be detected by the presence of dwarfed shoots bearing narrow, dried-up leaves; also on cutting the stems gum oozes out of the fibres, thus furnishing a convenient means of testing sets intended for propagation. Some varieties were found to be immune to inoculation, and it has been suggested that immunity is correlated with acidity of the sap.

A FIFTH instalment of new or noteworthy Philippine plants identified by Mr. E. D. Merrill forms supplement iii. to the first volume of the *Philippine Journal of Science*. *Pachycentra formicana*, an epiphytic shrub forming a new species of a Malayan genus, is characterised by bulb-like roots inhabited by ants; *Sundra supa*, a leguminous tree, yields timber serviceable for naval construction, and an oil suitable for making paint and varnish. Several new species of *Loranthus* are reported, also an *Anthoxanthum* similar to sweet-scented vernal grass, and a *Poa* related to *Poa pratensis*. The writer has drawn up two lists of plants, the one illustrating the floral relationship between the Philippines and the Celebes, the other showing the northern element in the Philippine flora.

THE curator of the botanic station in Dominica refers in his annual report for 1905-6 to the large demand, constituting a record, for young plants, the chief requests being for cacao and lime plants; a considerable number of budded orange plants, mostly of the Washington navel variety, was also supplied. In the matter of

manurial experiments with cacao, now extending over four years, a most striking result is noted for the plot mulched with grass and leaves, from which the yield per tree is higher than from the plot manured with phosphate, blood, and potash, and 77 per cent. higher than from the unmanured plot.

A SERIES of new African species of plants determined by various authorities appears as "Diagnoses Africanæ, XVIII.," in No. 7 of the *Kew Bulletin*. A *Cissus* collected by Mr. Dawe in Uganda is morphologically interesting on account of its bearing so-called "pearl-glands" that are regarded as food-bodies for ants. Mr. G. Massee contributes descriptions of a few new fungal species from the Gold Coast and elsewhere, as well as an article on potato-leaf curl. This disease is perpetuated by mycelium in the tubers or by conidia in the soil; it is also noted that the same disease occurs on tomatoes. An article by Mr. W. J. Bean relative to a visit to famous Scottish gardens furnishes a good account of the trees, especially conifers, that have been successfully grown in this northern, but by no means rigorous, climate.

WE have received from the Biological Laboratories, Massachusetts Institute of Technology, "A Statistical Study of Generic Characters of the Coccaceæ," by C. E. A. Winslow and Anne F. Rogers. A number of characters, such as average dimensions, manner of grouping, staining reactions, vigour of surface growth, acid production in dextrose and lactose broth, formation of nitrites and ammonia in nitrate solution, and chromogenesis, were determined for 500 cultures from various habitats, and tables are given showing the frequency distributions for single characters and pairs of characters. These tables indicate with great clearness the extreme variability of the Coccaceæ, and the impossibility of laying down hard and fast boundaries for the classification of individuals. At the same time, the authors show that certain natural types are apparent when the characters of the aggregate, and not of the individual, are considered, e.g. the relative frequencies of different forms of grouping, the reaction to Gram stain, the vigour of growth, the rapidity of formation of nitrites or ammonia, and the most frequent colour of the pigment formed. On the whole, they find that the last-named character is of most importance, and most highly correlated with other characters. The work is an interesting application of statistical methods (of a very simple kind) to the difficult problem of the classification of the bacteria.

THE October number of *The Central*—the Central Technical College Old Students' Assosociation magazine—includes an interesting illustrated article by Mr. Bernard Dunell on suction gas for marine propulsion. Mr. Dunell describes Messrs. Thornycroft and Co.'s efforts in the direction of a satisfactory gas-propelled barge, and also of a launch, and the results which have been obtained. The writer then goes on to describe some novelties in the construction of the engine frame and in the method of connecting the cylinder trunks to it, the object being to do away with heavy bolts, and also to make the operation of disconnecting the cylinder head as simple and as quick as possible. On the question of fuel, for engines up to 250 horse-power anthracite or coke is used, the reason being that a cleaner gas is obtained more readily and with a simpler apparatus than is possible with bituminous coal. The writer states that Messrs. W. Beardmore and Co. are just completing two marine gas engines and producers of 500 horse-power and 1000 horse-power respectively, and

in these cases ordinary bituminous coal will be used. The results on these large units will be awaited with interest both from the coal point of view and also from the "gas *versus* steam" for marine work. Mr. E. Mann Langley's contribution on electric train lighting deals with a subject of which in a general way very little is heard. Although the electric lighting of trains is now taken as a matter of course, so little is known about it that the author's description of the present-day methods of the generation, regulation, and the switching in and out apparatus between battery and dynamo is very welcome. Other papers in the same issue, on the evolution of the incandescent electric lamp, by Mr. A. S. E. Akerman, and single-phase electric traction, by Mr. L. Calisch, are of interest, the former especially as giving a description of the "Linolite" lamp.

WE have received from Messrs. A. Guinness, Son and Co., Ltd., of Dublin, a copy of part ii. of vol. i. of the Transactions of the Guinness Research Laboratory, printed for private use. The principal researches carried out at the laboratory, of which Dr. Horace T. Brown is director, and published in this part, are an exhaustive investigation of the nitrogenous constituents of malt which are soluble in water, and a study of the water-soluble polysaccharides of malt.

A REPRINT has been received of a lecture on "The Early Use of Iron," delivered by Mr. Bennett Brough before the Iron and Steel Institute at Glasgow in March, and published in No. 1 of the journal of the institute (pp. 233-253). The lecturer summarises recent investigations of the earliest records to be found of the use of the metal. An interesting account is given of the use of iron in ancient Egypt, Syria, India, and Europe, and of primitive methods of working iron which still survive in India and among the negro races of Africa.

THE Nobel lecture for 1906, delivered by Prof. Philipp Lenard on May 28 before the Royal Swedish Academy of Sciences, has been published under the title "Ueber Kathodenstrahlen" by the firm of J. A. Barth, of Leipzig (pp. 44, price 1.20 marks). It contains an admirable historical account of the development of our knowledge of cathode rays and allied phenomena, from the time of the early experiments of Crookes in 1879 to the present day. The most important stages in the investigation of the rays are clearly defined, and the story of the growth of the modern electronic theory of matter is told in a manner at once comprehensive and free from technicalities. The account given by Lenard of the genesis of his own experiments in this field is of no little historical value. A useful chronological review of the literature, comprising in all fifty-five papers, published between 1860 and 1906, is appended.

AN investigation of the dimorphism of calcium and barium carbonates has recently been described by H. E. Boeke in the *Zeitschrift für anorganische Chemie* (vol. 1., pp. 244-8, August 31). It is shown that barium carbonate when heated in an atmosphere of CO₂ exhibits a sudden arrest of temperature at 811°. This temperature, which varies only by a degree or two when the rate of heating is altered, represents a true inversion-point for the dimorphous carbonate. The reverse change takes place less readily, but is accompanied by a marked liberation of heat; when cooled rapidly the arrest-point was as low as 761°, but slower cooling showed an arrest at 795°, approximating towards the temperature of the sharply-defined arrest-point in the heating curve. In the case of

calcium carbonate there is a fairly definite temperature, $470^{\circ} \pm 3^{\circ}$ C., at which arragonite passes into calcite, but the change in this case is not reversible, and even at low temperatures calcite appears to be the stable, and arragonite the labile, form.

MESSRS. F. DARTON AND CO., Clerkenwell Optical Works, have sent us a copy of the latest issue of their list of electrical novelties. The catalogue may be commended to the attention of those who are interested in the application of electricity to domestic, medical, and other purposes.

MESSRS. F. E. BECKER AND CO., Hatton Wall, London, have submitted for our inspection a specimen of their "Nivoc" patent stencil. The stencil is designed to assist young students of science in making drawings of apparatus, and will be found of service for this purpose. At the same time, the adoption of stencils of this kind will deprive pupils of the practice necessary to enable them to develop the power of rapid, unaided sketching which, as Huxley long ago pointed out, is essential to the student of science.

A SECOND edition of Prof. A. E. H. Love's "Theoretical Mechanics. An Introductory Treatise on the Principles of Dynamics," has been published by the Cambridge University Press. The first edition of the work was reviewed at length in our issue for June 23, 1898 (vol. lviii., p. 169). It is only necessary to state that the changes which have been made in the present edition are, for the most part, of the nature of a re-arrangement of the order of the material. The consequence is that the theory has been presented in a less abstract fashion, and long preliminary discussions have been avoided.

A SECOND edition of the late Prof. P. Drude's "Lehrbuch der Optik" has just been published by Mr. S. Hirzel, Leipzig. The text has been revised, and forty pages have been added to the book in order to bring under consideration the work in magneto-optics and related subjects done since the original edition appeared six years ago (see NATURE, October 18, 1900, vol. lxii., p. 595). The manuscript of the new edition was completed and partly printed before Prof. Drude's lamented death, but Mr. F. Kiebitz has seen it through the press. The work has now an index.

THE twelfth volume of the new series of the *Reliquary and Illustrated Archaeologist* has now been published by Messrs. Bemrose and Sons, Ltd. It consists of the four quarterly numbers issued during the present year. The first of these parts includes a contribution by Mr. J. Patrick to the series of papers dealing with the sculptured caves of East Wemyss, in which the Factor's Cave is described. The April number contains an illustrated article by Mr. R. Quick entitled "Notes on the Evolution of the Means of Transport by Land and Water." The most primitive means of transport by land is stated to be by means of tent poles and skin tents, but it would be hard to prove that this method was primitive either in time or in culture, especially as the author credits "prehistoric man" with "a conveyance of logs of wood bound together by withes and carried in the hand, somewhat in the manner of the Chinese sedan chair." The July number includes two interesting papers by Mr. J. Charles Wall on Lastingham; one, "Pure Norman," describes the unique example of a pure Norman crypt, free from any intrusions of later architecture, and the other, "Lastingham Relics," tells of some of the treasures, mainly the

sculptured stones, to be found in the crypt. The concluding part is perhaps of less interest to the man of science. It contains, with other papers, an account by Charlotte Mason of the characteristics of Blythburgh and its church, and a short paper by Sophia Beale on the evolution of the ancient lamp.

OUR ASTRONOMICAL COLUMN

THE CALORIFIC RADIATION OF THE SUN.—Further results relating to the intensity of the solar calorific emissions are published in No. 17 of the *Comptes rendus* by MM. Millochau and Féry. Using the instrument described in their former note, and considering only the centre of the solar disc, they obtained measures at Meudon (altitude=150 m.), Chamonix (altitude=1030 m.), and the summit of Mont Blanc (altitude=4810 m.). Accepting the emissive power as being equal to unity, these gave 4820° , 5140° , and 5560° , respectively, when standardised by the electric furnace. All these measures were obtained when the sun was near the zenith, and the observers give a table showing the hourly variation of the apparent temperature from 8 a.m. to 6 p.m.

The maximum observed temperature on the summit of Mont Blanc was 5590° absolute, and, roughly correcting for the atmospheric absorption, this gives the final result as 5620° absolute.

THE SYSTEM OF 61 CYGNI.—In No. 4128 of the *Astronomische Nachrichten* Prof. Barnard discusses a series of measures of the double star 61 Cygni which he made on 144 nights between August 7, 1900, and November 12, 1904. These measures were undertaken for the purpose of testing Dr. Wilsing's hypothesis as to the existence of an unknown dark body in the system of this star. This observer found that his photographic measures indicated an apparent periodic oscillation, in the distance between the two components, of about $0''.3$, taking place in twenty-two months. If this oscillation were real its effect on the measures of the parallax of this star would be considerable, and might account for the large differences already obtained by various observers.

Prof. Barnard's results do not, however, confirm the hypothesis, although the observations extended over twice the interval of Dr. Wilsing's supposed period. The distance between the two components does not appear to be affected by any periodical variation, and only in one case does the distance difference exceed the mean by so much as one-tenth of a second of arc. It seems evident, therefore, that some cause other than that of a disturbing body will have to be found for the differences observed by Dr. Wilsing.

THE CAPE OBSERVATORY.—In his report of the work performed at the Cape Observatory during the year 1905, Sir David Gill states that the two underground azimuth-marks of the new transit circle are now working satisfactorily, and that the observations with this instrument show a systematic diurnal variation of azimuth amounting to about ± 0.02 second. When the observations of circumpolar stars are sufficiently discussed to determine the absolute variation of the azimuth-marks, it seems possible that these may prove sufficiently stable to permit of the determination of the horizontal component of Prof. Chandler's change of latitude. The automatic arrangements for regulating the pressure and temperature inside the sidereal clock-case are now perfect, the temperature never varying from 75° F. by more than one-tenth of a degree. The work for the Astrographic Chart and Catalogue was nearing completion at the end of 1905, and during that year 148 catalogue plates, containing 1944 standard and 112,086 other star images, were measured.

MINOR PLANETS.—In No. 4128 of the *Astronomische Nachrichten* Dr. Bauschinger publishes the numbers which have been allotted to the recently-discovered minor planets. From this list we see that the total number, up to June 21, 1906, was 601, and that thirty-two new ones were discovered between July 30, 1905, and that date, mostly at the Heidelberg Observatory. The same publication also contains a list of the names allotted to various minor planets between No. 459 and No. 562.